

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-15 (canceled).

Claim 16 (currently amended): A battery remaining capacity calculating method for calculating a remaining capacity as a capacity of electricity dischargeable by a secondary battery, said battery remaining capacity calculating method comprising:

measuring an output voltage value of said secondary battery;

dividing a ~~use-battery capacity consumption~~ mode of said secondary battery into a high consumption rate mode in which the output voltage value is not lower than a voltage threshold value and a low consumption rate mode in which the output voltage value is lower than the voltage threshold value;

calculating a remaining capacity in said low consumption rate mode on a basis of a predetermined nonlinear reference voltage curve as a discharge characteristic of said secondary battery and said output voltage value; and

calculating a remaining capacity in said high consumption rate mode supposing that there is minimal change in the remaining capacity at a time of change from said low consumption rate mode to said high consumption rate mode,

wherein determining the battery capacity consumption mode is independent of a temperature of the secondary battery.

Claim 17 (currently amended): The battery remaining capacity calculating method as claimed in claim 16, further comprising:

setting a reference remaining capacity as a remaining capacity before the battery capacity consumption ~~use~~-mode change and a start voltage as an output voltage at a time of a start of the high consumption rate mode, wherein a remaining capacity is calculated on a basis of said

reference remaining capacity, said start voltage, a predetermined cutoff voltage of said secondary battery, and said output voltage value.

Claim 18 (currently amended): The battery remaining capacity calculating method as claimed in claim 17, wherein the remaining capacity Q_m in said high consumption rate mode is calculated by an equation $Q_m = Q_n - Q_n \cdot \frac{(V_n - V_m)}{(V_n - V_t)} = Q_n \cdot \frac{(V_m - V_t)}{(V_n - V_t)}$

$$Q_m = Q_n - Q_n \frac{(V_n - V_m)}{(V_n - V_t)} = Q_n \left(\frac{V_m - V_t}{V_n - V_t} \right)$$

using the reference remaining capacity Q_n , the start voltage V_n , the cutoff voltage V_t , and the output voltage value V_m .

Claim 19 (currently amended): The battery remaining capacity calculating method as claimed in claim 16, further comprising:

setting a voltage gap as an output voltage change at the time of the battery capacity consumption use-mode change, wherein a remaining capacity is calculated on a basis of said voltage gap and said output voltage value.

Claim 20 (currently amended): The battery remaining capacity calculating method as claimed in claim 19, wherein an addition voltage value ($V_m + \text{DELTA} \cdot \Delta V$) is calculated by adding said voltage gap $\text{DELTA} \cdot \Delta V$ to said output voltage value V_m , and a remaining capacity at said addition voltage value ($V_m + \text{DELTA} \cdot \Delta V$) on said reference voltage curve is set as the remaining capacity Q_m in the high consumption rate mode.

Claim 21 (currently amended): The battery remaining capacity calculating method as claimed in claim 16, ~~wherein whether said secondary battery is in said low consumption mode or in said high consumption mode is determined by measuring an output current value of said secondary battery~~ further comprising:

determining that the battery capacity consumption mode has changed to a high consumption rate mode if a change in current consumption is positive and if a rate of change of current consumption exceeds a use mode switching threshold;

determining that the battery capacity consumption mode has changed to a low consumption rate mode if a change in current consumption is negative and if a rate of change of current consumption exceeds a use mode switching threshold.

Claim 22 (currently amended): The battery remaining capacity calculating method as claimed in claim 16, wherein whether said secondary battery is in said low consumption rate mode or in said high consumption rate mode is determined by detecting a change in output voltage of said secondary battery.

Claim 23 (currently amended): The battery remaining capacity calculating method as claimed in claim 16, wherein whether said secondary battery is in said low consumption rate mode or in said high consumption rate mode is determined on a basis of information from an electronic device side to which said secondary battery supplies power.

Claim 24 (currently amended): A battery remaining capacity calculating device for calculating a remaining capacity as a capacity of electricity dischargeable by a secondary battery, said battery remaining capacity calculating device comprising:

voltage measuring means for measuring an output voltage value of said secondary battery; and

arithmetic means for performing information processing, a reference voltage curve as a discharge characteristic of said secondary battery being recorded in said arithmetic means;

said arithmetic means divides a use-battery capacity consumption mode of said secondary battery into a high consumption rate mode in which the output voltage value is not lower than a threshold value and a low consumption rate mode in which the output voltage value is lower than the threshold value,

said arithmetic means calculates a remaining capacity of said secondary battery in said low consumption rate mode on a basis of the voltage value measured by said voltage measuring means and said reference voltage curve, and

said arithmetic means calculates a remaining capacity in said high consumption rate mode on a basis of a reference remaining capacity as a remaining capacity before a ~~use-battery capacity consumption~~ mode change, a start voltage as an output voltage at a time of a start of the high consumption rate mode, a predetermined cutoff voltage of said secondary battery, and said output voltage value,

wherein determining the battery capacity consumption mode is independent of a temperature of the secondary battery.

Claim 25 (currently amended): The battery remaining capacity calculating device as claimed in claim 24, wherein said arithmetic means calculates the remaining capacity Q_m in said high consumption rate mode by an equation ~~$Q_m = Q_n - Q_n \cdot \frac{(V_n - V_m)}{(V_n - V_t)}$~~ $Q_m = Q_n - Q_n \cdot \frac{(V_n - V_m)}{(V_n - V_t)}$ ~~function.~~

$$Q_m = Q_n - Q_n \frac{(V_n - V_m)}{(V_n - V_t)} = Q_n \left(\frac{V_m - V_t}{V_n - V_t} \right)$$

using the reference remaining capacity Q_n , the start voltage V_n , the cutoff voltage V_t , and the output voltage value V_m .

Claim 26 (currently amended): A battery remaining capacity calculating device for calculating a remaining capacity as a capacity of electricity dischargeable by a secondary battery, said battery remaining capacity calculating device comprising:

voltage measuring means for measuring an output voltage value of said secondary battery; and

arithmetic means for performing information processing, a reference voltage curve as a discharge characteristic of said secondary battery being recorded in said arithmetic means;

wherein said arithmetic means divides a ~~use-battery capacity consumption~~ mode of said secondary battery into a high consumption rate mode in which the output voltage value is not lower than a threshold value and a low consumption rate mode in which the output voltage value

is lower than the threshold value, said arithmetic means calculates a remaining capacity of said secondary battery in said low consumption rate mode on a basis of the voltage value measured by said voltage measuring means and said reference voltage curve, and said arithmetic means calculates a remaining capacity in said high consumption rate mode on a basis of a voltage gap as an output voltage change at a time of a use mode change and said output voltage value, and
wherein determining the battery capacity consumption mode is independent of a temperature of the secondary battery.

Claim 27 (currently amended): The battery remaining capacity calculating device as claimed in claim 26, wherein in said high consumption rate mode, the remaining capacity is calculated on a basis of said reference voltage curve and an addition voltage value ($V_m + \Delta V$) obtained by adding said voltage gap ΔV to said output voltage value V_m .

Claim 28 (currently amended): A battery remaining capacity calculating program for calculating a remaining capacity as a capacity of electricity dischargeable by a secondary battery, said battery remaining capacity calculating program comprising making a processor perform:

- a voltage measuring step of measuring an output voltage value of said secondary battery;
- a mode determining step of dividing a use-battery capacity consumption mode of said secondary battery into a high consumption rate mode in which the output voltage value is not lower than a threshold value and a low consumption rate mode in which the output voltage value is lower than the threshold value;

- a low consumption time remaining capacity calculating step of calculating a remaining capacity in said low consumption rate mode on a basis of a predetermined nonlinear reference voltage curve as a discharge characteristic of said secondary battery and said output voltage value; and

- a high consumption time remaining capacity calculating step of calculating a remaining capacity in said high consumption rate mode supposing that there is little change in the remaining capacity at a time of change from said low consumption rate mode to said high consumption rate mode,

wherein determining the battery capacity consumption mode is independent of a temperature of the secondary battery.

Claim 29 (currently amended): The battery remaining capacity calculating program as claimed in claim 28, wherein in said high consumption time remaining capacity calculating step, the remaining capacity is calculated on a basis of a reference remaining capacity as a remaining capacity before the ~~use~~battery capacity consumption mode change, a start voltage as an output voltage at a time of a start of the high consumption rate mode, a predetermined cutoff voltage of said secondary battery, and said output voltage value.

Claim 30 (currently amended): The battery remaining capacity calculating program as claimed in claim 28, wherein in said high consumption time remaining capacity calculating step, the remaining capacity is calculated on a basis of a voltage gap as an output voltage change at the time of the ~~use~~battery capacity consumption mode change and said output voltage value.